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UNIVERSITY OF ALBERTA

OCCURRENCE OF LOW BACK PAIN AMONG PHYSICAL THERAPISTS IN EDMONTON

BY

MAC MIERZEJEWSKI

A thesis submitted to the Faculty of Graduate Studies in partial fulfilment of the requirements for the degree of

MASTER OF SCIENCE

DEPARTMENT OF **PHYSICAL THERAPY**

Edmonton, Alberta

SPRING 1994

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ABSTRACT

This descriptive study provides data on the occurrence of work-related low back pain within the physical therapy profession and describes the personal and professional characteristics of physical therapists who reported pain.

Four hundred sixty two physical therapists living in the city of Edmonton, Alberta were surveyed by mail in the summer of 1993. Three hundred eleven (67.3%) questionnaires were voluntarily returned. The analyzed sample was later divided into two categories: those with work-related and those without work-related low back pain. Nineteen personal and professional characteristics such as sex, age, year graduated, academic training, medically diagnosed conditions before developing LBP, physical disability, diagnosis of physical disability, current job title, last job title, current specialty, last speciality, years of experience, primary work setting, primary position held, time held current employment, full versus part time employment, hours of direct patient contact per week, secondary position held, and LBP before working as a physical therapist were used to compare these two groups. No significant differences ($p \leq .05$) between the groups were seen.

An occurrence rate of work-related LBP of 49.2% was found using an unlimited recall period. A majority (64.7%) of physical therapists reported recurrent episodes of work-related low back pain.

The initial onset of work-related low back pain most frequently occurred in the age period from 20 to 30 years, and within the first five years of experience as a physical therapist.

Hospitals and private practices were the most prevalent work settings in which injury occurred.

Patient handling, bending, stooping, lifting, caring, pushing, and pulling were the commonly described activities causing precipitation of injury.

The severity of back discomfort had been sufficient enough to require 13.7% of therapists to stop their work.

Despite low back pain, 54 (35.3%) of the subjects with work-related LBP continued to work. Two therapists from this group were out off work due to LBP at the time of completing the questionnaire.

The most frequently (50.0%) reported location of pain was the area of the low back and buttocks.

The Disability Index Questionnaire was used to assess present level of disability among physical therapists with current LBP. Over half (55.4%) respondents indicated little or no disability.

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CHAPTER I

STATEMENT OF THE PROBLEM

Low back pain (LBP) is reported to be the most common type of chronic pain and number one compensable disability[63]. This condition is a major cause of absenteeism and compensation claims among health care workers[1]. Overall, up to 80 percent of people will be affected by LBP at some point in their lives[45].

Occupational low-back injury is a common and expensive health problem. Statistics Canada (1988-1989)[89] stated that LBP was the cause of 27% of all compensable injuries. In Alberta alone back pain constitutes 45.7% of all compensable injuries[52]. There is remarkable similarity in the number of low back injuries as a percentage of all reportable occupational injuries between Great Britain (27%), Ontario (23%), and the United States (26-29%)[63]. These rates have showed very little variation through the years. The musculoskeletal diseases have a major impact on health care in North American and Western European countries. A significant portion of this overall health problem is attributable to diseases of the low back[45].

Within the health care profession, this condition has been studied most frequently among nurses. Nurses injure their backs at an earlier age than other industrial workers[74] and have a relatively high incidence of back pain, neurological signs and officially reported strain injuries[9,26,38,74,90,91,97]. The factors most commonly associated with back pain among nurses have originated from patient handling and postural

stress[8,9,28,38,48,52,60,73,74,96].

The physical therapy profession is a stressful occupation in terms of the presence of factors correlated with back pain. Associations of low back pain with lifting[22.61], bending and stooping[14,16,33,52,54,77], twisting and turning[16,33,102], prolonged sitting or standing[61], as well as cumulative load[52,53] have been widely reported in the literature. Many work related duties performed by physical therapists, as well as nurses, involve considerable amounts of these activities. In fact most physical therapists reporting work related LBP were treating or handling a patient at the time of injury[68]. Many therapists may be at risk for LBP due to the combination of prolonged stooping, repetitive low risk lifts and infrequent high risk lifts. These activities may lead to LBP, if proper body mechanics are not observed.

The possible consequences of LBP are lost work time because of sick leave, decreased economic productivity and changes in quality of life[68]. Due to low back pain, the individual may become unable to return to work or may become physically disabled[2,3,13,24,64,79,80,98,99].

In short, there is ample evidence to indicate that LBP problems are extremely prevalent and costly and appear to be rising at a faster rate than other types of compensable injuries[101]. The physical therapy population is at great risk for developing LBP, and the number of back injuries is high[68,85].

There is, however no information available concerning occurrence of low back pain within the physical therapy

profession in Canada. Thus, the purpose of this study was to determine the relationship of selected characteristics to the occurrence of work-related low back pain among physical therapists.

OBJECTIVES OF THE STUDY

The primary objective of this study was to determine the occurrence of work-related low back pain among physical therapists and to describe:

- personal and professional characteristics of those with, and those without work-related low back pain,
- current low back pain and resulting disabilities of those with work-related low back pain.

RESEARCH QUESTIONS

The research questions of this study were:

1. Is the occurrence rate of work-related low back pain among physical therapists in Edmonton similar to that reported in the literature? Is it comparable to those of the nursing profession?

2. Does the initial onset of work-related LBP occur more frequently in a specific age group? Does the number of LBP episodes change with the time from graduation as a physical therapist?

3. Are there any work settings in which LBP occurs more frequently? What activities are being performed during injury? Does work-related LBP result in decreased non-work activities, absence from work, decreased number of working hours, restricted duties at regular job, or change of work setting?

4. Do physical therapists with current pain have any disabilities due to work-related LBP? Do they continue to work despite pain? What are the sites of LBP?

5. Are there differences in gender, age, year graduated, academic training, medically diagnosed conditions before developing LBP, physical disability, diagnosis of physical disability, current job title, last job title, current speciality, years of experience, primary work setting, primary position held, time held current employment, full versus part time employment, hours of patient contact, secondary position held, LBP before working as a physical therapist, between groups of physical therapists with and without work-related low back pain?

OPERATIONAL DEFINITIONS

1. Disability is the loss or absence of the ability of an individual to meet personal, social, or occupational demands, that is consequent upon impairment.

2. Low back pain (LBP) is pain in the region of the back corresponding to the lumbar or sacral vertebrae.

3. Work-related low back pain is pain in the lumbar or sacral region precipitated due to work as a physical therapist.

4. The physical therapists without work-related low back pain are those who had not experienced pain in the lumbar or sacral region due to work as a physical therapist.

CHAPTER II

LITERATURE REVIEW

EPIDEMIOLOGY AND IMPACT OF LOW BACK PAIN

Disorders of the lumbar spine are among the most common medical problems in Western Countries, affecting up to 80% of population at some time during their lives[11,33,44]. This figure varies with the type of subject studied, the method of data collection, and the definition of LBP used. Between 10% and 17% of adults have a back pain episode each year[25,29]. It was calculated by Graizier et al. (1984)[34] that about 31 million Americans experience some back pain. The syndrome of backache does not discriminate against sex, race or work environment, although some groups are more susceptible to pathology than others[10,11,66].

Information obtained from different countries should be considered separately because data is significantly determined by local legal, social and economic factors.

In the United States, data from the National Center for Health Statistics[70] indicated that among chronic conditions, impairments of the back and spine are the most frequent cause of activity limitation in persons under age 45, the largest age group within the workforce. Klein et al. (1984)[48] estimated that 19 to 25.5% of all workers compensation claims were due to back pain in 1979. According to the Bureau of Labour Statistics, these job-related injuries and illnesses occurred

in the United States in 1985 and 1986 at a rate of 7.9 cases per every 100 full-time workers[18]. These alarming numbers are misleading, since recovery without a physician's consultation can be demonstrated in 80-90% of all episodes[63]. Despite the capability of the lumbar spine to heal itself, the recurrence rate is just as high as the initial incidence rate[63].

About 25% of all working men in United Kingdom are affected by low back disorders each year[37]. Annually, one out of 25 workers changes his job because of back condition. In 1978, one third of all musculoskeletal complaints were back related, with 2.1% of the population having reported sick[105]. Studies from general practitioners in England[30,100] have indicated that each year more than 2% of the population consults a physician because of low back pain. Between the ages of 50 and 59, the proportion increases to 5%.

Helander (1973)[40] estimated that between 1961 and 1971, 12.5% of all annual sickness absence days in Scandinavia were related to low back disorders. Forty percent of the low back affected workers were disabled for less than one week, while 9.9% were disabled for more than six months. The prevalence of 7.1% of chronic back pain was reported in Finland in 1976[47]. A study done in Copenhagen by Gyntelberg (1974)[36] found that 25% of the employed surveyed population reported experiencing LBP in the previous year, and 8% were absent from work because of LBP.

McGill (1968)[66] showed that employees with back problems

who are absent from work for more than six months have only a 50% chance of ever achieving productive employment again. Absenteeism of longer than one year reduces this probability to 25%. Manual handling injuries were responsible for almost 90% of all such injuries. In some industries, particularly health care, low back claims accounted for between 40% and 50% of all workers compensation claims[17]. LBP is diagnosed in 10% of all chronic health conditions[44]. Sickness absence due to LBP is usually of longer duration in workers performing heavy jobs than in those doing light work[26].

It is difficult to determine accurately the cost of work-related low back pain, since many variables are involved. The cost of industrial LBP can be divided into direct and indirect costs[101]. Direct costs include payments for medical care and compensation for lost wages, and are usually covered by workers' compensation insurance. Indirect costs include greater insurance premiums, production time lost, loss of materials, property damage, lost wages, administrative and legal costs, and the cost of training a new employee to replace one who has been injured[94].

In a study for The American Academy of Orthopaedic Surgeons, Holbrook et al. (1984)[41] demonstrated that the total annual cost for all LBP in the United States was $15.85 billion. In comparison, a recent study by Webster and Snook (1990)[101] estimated that the total compensable cost for 1986 LBP cases in the United States during 1986 was $11.1 billion.

This represents a 241% increase over the 1980 estimated total compensable cost of $4.6 billion. The total worker's compensation costs for the same period increased 184%.

Numerous attempts were made to estimate the average cost per case of LBP[12,48,57,86,87]. The expenses of low back injury are not equally distributed. Webster and Snook (1990)[101] calculated that the mean cost per case was $6807 and the median cost was $391. Twenty-five percent of the cases accounted for 95% of the costs, therefore, they were highly skewed toward the more expensive cases. These percentages are similar to previous studies that reported 25% of the cases were associated with 90%[87] and 93%[86] of the costs. The higher cost cases were related to greater amounts of hospitalization, surgery, litigation, psychologic impairment, and extensive lost time[101].

Exclusively in Canada, the total number of disability days due to LBP exceeded 21 million, and the average sickness absence period was 21.4 days[78]. One and half million Canadians see their family physicians each year for back pain. Statistics Canada (1988)[89] stated that LBP was the cause of 27% of all compensable injuries. The prevalence of 4.4% was reported by Lee[58] et al, in 1985. In Alberta alone back pain constitutes 45.7% of all compensable injuries[52].

Similar statistics of the general incidence and associated costs of back pain can be found for most developed countries. In fact, compensable medical claims for low back injury ranged from 10 to 30 percent of all claims a year in industrial populations[4,22].

ETIOLOGY AND RISK FACTORS

Despite such impact, much remains to be learned about the causation of low back pain, having both occupational and non occupational origins[44,48,106]. Dillane et al.[30] (1966) reported that 79% of first time attacks of low back pain in men and 89% in women, were of unknown specific causes. However, a variety of risk factors have been identified. Back pain can result from a single cause or multiple pathological causes[10,69]. Kumar (1990)[52] listed the following risk factors: history of back pain; family history of annular fissure and disc protrusion; tallness and body mass; vertebral canal diameter; isometric strength; early work experience; heavy physical work; lifting, stooping or bending; pushing, pulling or carrying; static work postures; psychological factors; cigarette smoking and chronic cough; inflammatory effect of nucleus pulposus; cumulative load; pregnancy; and driving. The correlation between the mobility of trunk, muscle function and LBP disorders has also been noted[19,59,95].

Stress on the spine is caused by all activities involving the movement of the trunk and the exertion of force through upper extremities. Several researchers have looked into the problem of the spinal load distribution[4,5,6,7,31,35,42,50,52,54,67,88]. The National Institute for Occupational Safety and Health (NIOSH; 1981)[71] has recommended that predicted L_5/S_1 compression values above 3400 N be considered potentially hazardous for people 60 years or over. If the values are

greater than 6700 N, the job should not be permitted for anybody, because it is unsafe and may cause back injury. Kumar (1992)[55] presented a comparative representation of the safety margin by various approaches: biomechanical 12% - 14%, psychophysical 30% - 45%, EMG 33% - 50%, IAP 50%. These values may serve a useful function in assessing the margins of safety during frequently performed manual tasks in health care settings. Most of such tasks are dynamic. A comparison of static and dynamic load lifting by McGill and Norman (1985)[67] disclosed that the peak dynamic moments at the L_5/S_1 disc were 19% higher than the static analyses predicted. Peak forces were incurred early in such motion, when the load was still close to the floor. In general, slower lifts are less stressful to the back than faster lifts, particularly when using the common stoop back lift method[20]. Park (1973)[76] stated that acceleration during dynamic lifting increased the biomechanical stress by 15%-20%. The data presented is related to injuries and margin of safety. However, determination of an optimal level of safety margin is very difficult and requires further investigation.

A strong association between cumulative load and LBP was reported by Kumar in 1990[52]. Repeated load application may result in cumulative fatigue, which reduces the tissues' stress-bearing capacity. Fatigue life was found to be related to dynamic stress raised to a power of nearly ten[51]. Sandover (1983)[84] suggested two -possible hypotheses. First, the dynamic

compressive loading may lead to fatigue induced microfractures at the endplate or subchondral trabeculae, followed by callus formation. The latter will impede the nutrient diffusion, thereby accelerating the degenerative process. Second, dynamic shear, bending, and rotational loading of the joints may lead to fatigue induced breakdown of the annular lamellae, speeding up annular degeneration. Such metabolic and mechanical disturbances may play a pivotal role in precipitation of LBP problem. The structural failure of spinal units can precipitate in either acute or chronic conditions.

LOW BACK PAIN AMONG NURSES, NURSING AIDES, AND PHYSICAL THERAPISTS

Within the health care professions, low back pain has been studied most frequently among nurses. Occupational studies on back pain showed nursing to be a high risk profession. Nurses have a relatively high incidence of back pain, neurological signs and officially reported strain injuries[9,26,38,74,90,91,97]. In the United States, nursing aides and licensed nurses ranked fifth and ninth respectively, based on workers' compensation claims, for back sprains and strains per 100 workers[48]. The lifetime prevalence of LBP among nursing professionals has been reported to vary from 35%[26] to 81%[97]. Unfortunately, these studies cannot be easily compared because of differing methodologies and criteria for identifying those with back pain, and inconsistent use of prevalence and incidence data[15]. Age, length of employment, and knowledge of

lifting principles were predominant risk factors associated with LBP. In fact, nurses injure their backs at an earlier age than other industrial workers[74]. Cust et al. (1972)[26] demonstrated that trained nurses had their highest incidence between one and four years of service, which was confirmed by several scientists[28,91,97]. Stubbs et al. (1983)[91] found that 43% of nurses who reported back pain had experienced seven or more episodes. A number of factors indicated that the conditions being assessed in each case may be different.

Videman (1984)[97] investigated the prevalence of LBP and sciatica in relation to age, work-load, free time activities, menstruation, pregnancies and number of children among nurses and nursing aides. The nursing aides had more LBP, more symptoms of sciatic distribution, and their physical work load was heavier. The relation between the heaviness of physical work load and LBP was most evident under the age of 30. Low back pain leading to unfitness for daily tasks in the previous five years was reported by 18% of qualified nurses and 29% of nursing aides.

Harber et. al.(1985)[38] documented that LBP is frequently unreported to the employee health service. Most nurses probably continue their tasks despite discomfort, markedly decreasing work efficiency. Overall, 52% of nurses reported that they had developed back pain due to work during the previous six months. More than 40% of the staff reported at least one episode of pain that developed at work during a two week period. The severity of back discomfort had been

sufficient to require at least 15% to stop their work at least once during that period. Only 4% of the respondents had ever been hospitalized for back pain, and only 2% reported a history of surgery for these disorders. There were no differences due to nursing division assignment but significant association with specific tasks. The factors most commonly associated with back pain among nurses have originated from patient handling and postural stress[8,9,28,38,48,52,60,73,74,96]. The exposure to the postural load at some part of the day is significantly high in terms of standing and stooped postures[9]. Owen and Garg (1989)[75] reported that wheelchair to bed and bed to wheelchair transfers were ranked in the top four on a list of 16 patient handling task categories for perceived physical stress by the nursing aides.

Improper lifting techniques and movements associated with lifting are important risk factors for LBP[22]. Workers involved in heavy lifting have been found to have about eight times as many low back injuries as those performing sedentary work[22]. The Health and Safety Executive (1978)[39] noted that some of the lifting done by nurses is in an emergency situation, where the basic rules of training, which include the desirability of summoning help, may not always be appropriate. Inability to apply biomechanical principles of lifting, recommended in the literature[65], may be shown by the following examples: nurses often lift loads greater than 35% of their own body weight, usually the load is asymmetric, bulky and cannot be held close to the body, and the help the patient can give cannot always

be predicted[74]. Furthermore, the irregular nature of the work often precludes having adequate assistance. Some of the problems of lifting may be obviated by the provision of suitable equipment or by implementing safer systems at work[39]. A report by the Royal College of Nursing (1979)[82] placed a heavy emphasis on improving the training of nurses in lifting techniques and usage of hoists, evaluation and development of lifting techniques, as well as ergonomic analysis of potentially hazardous situations at work.

There has been much interest in the role of training in techniques of patient handling, with respect to control of back problems within the nursing profession[92]. Psychological stress is also a significant factor contributing to back injury[27,49,62]. Nursing aides with back symptoms exhibited in general a lower level of overall satisfaction with the job, perceived more negative relations with supervisors and workmates.

Stubbs et al. (1986)[93] conducted a survey of nurse leavers and attempted to estimate the extent to which back pain is implicated amongst those lost to the profession. Of every 1000 nurses permanently leaving the nursing profession, eight reported back pain as their sole reason. Three and half percent of all nurse leavers proclaimed back pain as a main contributory factor. Such a study does raise the issue of the cost to the service of losing experienced staff[15]. These costs include recruitment, retraining, compensation, possible legal fees and the effect of low morale in wards experiencing high

staff turnover.

The physical therapy profession is a stressful occupation in terms of the presence of factors associated with back pain. The work of a physical therapist involves considerable amounts of bending, reaching, twisting and lifting. Many therapists may be at risk for LBP due to the combination of prolonged stooping, repetitive low risk lifts and infrequent high risk lifts. These activities may lead to LBP, if proper body mechanics are not observed.

In California, Molumphy et al. (1985)[68] reported that 29% of examined physiotherapists experienced work-related back pain. The initial episode of work-related LBP most frequently (64%) occurred between the ages of 21 and 30 years. Fifty-eight percent of the initial episodes occurred during the first four years of experience as a physical therapist.

Eighty-three percent of the physical therapists reporting work related LBP were treating or handling a patient at the time of injury. The two most prevalent work settings in which physical therapists were engaged when back pain initially occurred were acute care (46%) and rehabilitation (25%).

Sudden lifting, bending and twisting were the activities most frequently associated with injury precipitation. Forty-one percent of the sample used sick-leave because of pain at the time of injury, 17% received worker's compensation benefits. Work related LBP was the cause of changes in work settings by 18% of the physical therapists. The therapists showed a tendency to move from acute care and rehabilitation

settings to settings where patients have less need for acute care. In addition, 12% of physical therapists who reported work related LBP decreased hours of patient contact because of their pain. Sixty-three percent of the therapists reported recurrent episodes of work related LBP within five years of the initial onset. There was no sex difference in the incidence of LBP.

Scholey et al. (1989)[85] compared the pattern of back pain in physiotherapists to that in a control group. The study showed a similar occurrence of back pain in physiotherapists and a control group, despite the fact that almost all the physiotherapists had been involved with back care education. Initial back pain was experienced more frequently in rehabilitation services where heavily dependent patients were treated. As was stated by the researchers, the physical therapists' training may have been effective in counterbalancing the effects of a stressful occupation. Further investigation is required to test these hypotheses.

SUMMARY

It is apparent that LBP is a common disorder, affecting a large number of workers; that it often occurs at the work place and therefore qualifies subjects for worker's compensation; that it requires an expensive, prolonged and complicated treatment; that the physiotherapy profession is prone to this affliction; that there has been little study done on the subject among physical therapists and that more study should be conducted, especially among Canadian subjects.

CHAPTER III

RESEARCH METHODS

STUDY PARTICIPANTS

The College of Physical Therapists of Alberta (CPTA) was contacted (Appendix A) for address labels of physical therapists living in Edmonton. Permission was obtained and the labels were purchased. Home addresses were used to ensure that physical therapists who were off work were included in the study. Four hundred and sixty-two questionnaire packages were mailed to everyone on the list. A self addressed, stamped envelope was included to facilitate the response rate. A four-week time period was allowed to respond to the questionnaire.

It was feared that a group of therapists with low back pain would be missed if a random sampling procedure was used. Therefore, the whole population living in a desired area was selected. Edmonton was chosen as a matter of convenience.

Three hundred thirty-seven (72.9%) of physical therapists returned the questionnaire. Of the 337, 26 blank returns were excluded from the study. Therefore, 311 (67.3%) completed and valid questionnaires were analyzed. Since the response rate was quite high, there is a high probability that the sample is representative. However to assess its representativeness, the sample was compared to the whole population on its only known characteristics, gender distribution. In order to identify

gender of the physical therapy population three people were asked to serve as the independent judges. Each of them was given a list of therapists and was asked to assess gender from the Christian names appearing on the list. Based on the information given by the judges, each of the subjects was classified as a male or a female. The analyzed sample (17.7% males, 82.3% females) was considered to be similar to the whole group (18.4% males, 81.6% females) based on sex distribution.

There could be several possible reasons for lack of response of some therapists. Two possible explanations for this finding are proposed. One, the survey was conducted during summer. Some therapists could be away from home, for the time given to respond to the questionnaire. The second reason is that those who had not experienced low back pain could not be interested in this study.

THE INSTRUMENT

Each survey package consisted of an introductory letter (Appendix B) stating the purpose of the study, a questionnaire (Appendix C), and a self addressed, stamped envelope to facilitate the response.

Every questionnaire was identified only by the code number to assure anonymity and was designed for self-administration. A pilot study was conducted among physical therapists working at the University of Alberta Hospitals.

Twenty-four therapists were asked to complete a questionnaire and comment on it. The following modifications were made as a result of the respondents' comments:

1. **SECTION 1**, "4. Academic training" - M.Sc.(PT) was suggested to be too restrictive. It was changed to M.Sc.

2. **SECTION 1**, "5. Did you suffer from following medically diagnosed and treated conditions before you developed LBP?" "No" option was added.

3. **SECTION 3**, "This section contains questions related to low back pain (LBP) **while working as a physical therapist"** was changed to "This section contains questions related to low back pain (LBP) **due to work as a physical therapist"**

The questionnaire (Appendix C) was organized in four sections. The first two sections were completed by all physiotherapists. Any respondent who had not experienced LBP due to work as a physical therapist was asked to omit sections three and four of the questionnaire.

The first section sought personal information (sex, age, academic training, medically diagnosed and treated conditions before developing LBP, physical disability) and employment history (job title, area of speciality, experience as a physical therapist, work setting and position to which

assigned currently, length of time on this work setting, full versus part time employment, and hours of direct patient contact per week). The second included history of LBP before working as a physical therapist (month and year of the onset of pain/injury, average pain intensity, duration of pain in days, setting in which injury occurred, activities being done during injury, and limitations due to LBP).

The third section concerned work-related LBP. The questions in this section focused on: time of onset of pain/injury, average pain intensity, duration of pain in days, work setting in which injury occurred, activities during injury, and limitations due to LBP.

The last, fourth section concerned current low back pain. Each respondent suffering from work-related LBP and presently experiencing pain was asked to mark location of pain on body diagrams and describe current intensity of pain using a pain rating scale. The Disability Index Questionnaire[81] was used to assess present level of disability. Participants were given a score of one point for each of the items that were ticked. An individual's score could thus vary from zero (no disability) to twenty-four (severe disability). No modifications of the Disability Index Questionnaire were made, except adding it into the questionnaire devised for the purpose of this study.

The Disability Index Questionnaire was developed as part of a study designed to describe the natural history of back pain in patients aged 16 to 64. The patients involved in the

questionnaire's development came from all social classes, were mainly Caucasian, and experienced low back pain. The questionnaire was constructed by choosing statements from the Sickness Impact Profile. Sickness Impact Profile (SIP) is simple, has high reliability and validity, and provides a great deal of useful clinical information about disabilities in various areas - physical function, communication, cognitive, and social activity[104]. The statements selected from SIP, to be used in the Disability Questionnaire, cover a range of aspects of daily living. The Disability Questionnaire was designed to be completed by the patients without assistance in about five minutes.

It is a reliable and sensitive measure of disability in low back pain. In order to measure its short-term repeatability authors asked twenty consecutive patients to complete a second questionnaire at home on the evening of the same day. The correlation coefficient between the two sets of scores was **0.91**.

The Disability Questionnaire was validated by comparison between the responses to this questionnaire and certain physical signs recorded by the doctor. Of those 91 patients in whom the doctor recorded an abnormality of gait or sitting 81 (89%) had ticked the statement "I walk more slowly than usual because of my back". Likewise, of those 124 patients in whom the doctor recorded that flexion of the spine was limited, 108 (87%) ticked the statement: "Because of my back pain, I try

not to bend or kneel down"[81].

The total score of the questionnaire was not significantly related to age, sex, social class of the patient, or marital status. The scores recorded by authors suggest that the questionnaire could also be used with more severely disabled population.

PROCEDURE

After getting the protocol approved by the SPERRC Committee of the Department of Physical Therapy at the University of Alberta, the introductory letters and the questionnaires were printed, assembled and mailed.

All participating physical therapists' identities were considered confidential. Each questionnaire was identified only by a three-digit number. The access to the code numbers was limited to the investigator and his academic supervisor.

The introductory letter was sent with every questionnaire. It was stipulated that by responding to the questionnaire each participant was giving consent to participate in the study and permission for the results to be published. Participation in this project was voluntary. The subject could refuse to answer any questions. A four-week time period was allowed to respond to the questionnaire. Data collection started on August 16, 1993 and continued until September 15, 1993. Three hundred five questionnaires were returned within the given time period. On September 15, 1993

non-respondents were identified using three-digit code number and recontacted by a follow-up letter (Appendix D). As a result, an additional 32 questionnaires were returned.

DATA ANALYSIS

The returned data were stored on a floppy disk. Accuracy of data entry was confirmed by the researcher by checking entered data against fifteen, randomly selected, questionnaires. No discrepancies between entered data and selected questionnaires were found. The responses were analyzed using the SPSS for Windows release 5.0.1 programme on the University of Alberta IBM PRO-SPEC 486 DX computer.

Frequency distributions were calculated on each item of the questionnaire to determine the characteristics of the sample. Descriptive statistics in the form of means, standard deviations, modes, maximum/minimum values, ranges, percentages, and cross-tabulations were computed to determine the demographic profile of the subjects.

Each subject could describe up to nine episodes of work-related LBP and could chose more than one answer. The information gathered separately from each of LBP episodes was summarized and multiple response frequencies were used to calculate following variables: setting in which injury occurred, activities being done during injury, and limitations due to LBP.

A chi-square test was used to see if there were any

significant differences ($p \leq .05$) between groups with and without work-related low back pain. The following categorical variables were examined: sex, age, year graduated, academic training, medically diagnosed conditions before development of LBP, physical disability, diagnosis of physical disability, current job title, last job title, current specialty, last speciality, years of experience, primary work setting, primary position held, time held current employment, full versus part time employment, hours of direct patient contact, secondary position held, and low back pain before working as a physical therapist. In order to compensate for multiple testing, a Bonferroni correction was applied to chi-square tests. Since 19 variables were compared, the alpha level was set at 0.003 (0.05/19=0.003).

Disability resulting from LBP was assessed using the Disability Index Questionnaire's score. Participants were given a score of one point for each of the items that were ticked. An individual's score could thus vary from zero (no disability) to 24 (severe disability).

LIMITATIONS

1. The responses related to the onset of low back pain should be treated with caution since long term recall may be biased. A physical therapist reporting work related LBP may be biased self-observer.

2. A precise definition of work-related low back pain was not included in the questionnaire. It was believed that physical therapists were knowledgable and would not categorize pain in another region as LBP. Even light ache could be classified as low back pain increasing significantly the occurrence rate.

3. Drawbacks associated with the mail questionnaire are the inabilty to check the responses given and by whom they were answered. Furthermore, there is no certainty that the questions were thoroughly understood.

4. Although, all the physical therapy population in the city of Edmonton was surveyed, the questionnaires may be biased by underreporting or non response of specific groups of therapists. Perhaps, particular therapists without low back pain did not wish to participate in the study because of lack of interest. It is also possible that physical therapists with low back pain would be more likely to answer the questionnaire. Nevertheless, it was believed by the researcher

that this sample was representative of the physical therapy population in the city of Edmonton.

IMPLICATIONS FOR FUTURE RESEARCH

This study provides basic data on the occurrence of work-related LBP within the physical therapy profession, which could be used for future research.

In order to evaluate the forces acting upon the physical therapist's body during manual lifting activities, the biomechanical analysis of compression loads on L_5/S_1 disc during selected treatment tasks should be conducted. It is suggested that an analysis might be performed of the following categories: standing assistance (assistance from sitting to standing and vice versa), transfers (wheelchair to bed or mat, and vice versa), and passive exercises on the floor or mat (lifting in a stooped and/or twisted position). The resulting compression loads could be compared to those recommended by National Institute of Occupational Health and Safety standards for action limits, to see if they constitute a risk for back injury.

More formal research within the physical therapy profession into epidemiology, etiology, and prevention of LBP is needed. Future research on this subject should be limited to a specific time period. The association between work-related low back pain and low back pain precipitated outside of work should be investigated.

CHAPTER IV

RESULTS

The results of this survey provided a descriptive profile of physical therapists in the city of Edmonton. The sample consisted of 311 subjects, 55 (17.7%) males and 256 (82.3%) females. This sample was further divided into two subgroups: those with work-related low back pain, and those without work-related low back pain.

STUDY GROUP DESCRIPTION

The occurrence rate of work-related LBP

One hundred fifty three (49.2%) of the surveyed physical therapists reported work related LBP at some point in their lives. One hundred fifty eight (50.8%) of subjects did not experience work-related low back pain (see Table 1).

Gender

Table 1. Distribution of respondents by gender

Variable	Group with work-related LBP	Group without work-related LBP	Total sample
Number of males	25	30	55
Number of females	128	128	256
Total number	153	158	311
Percent of males	8.03	9.65	17.68
Percent of females	41.16	41.16	82.32
Total percent	49.19	50.81	100.00

Age

The age of respondents ranged from a minimum of 21 to a maximum of 64 years, with a mean age of 35.8 years, and standard deviation of 9.11 years (Table 2).

Table 2. Age characteristics of respondents in years

Variable	**Group with work-related LBP**	Group without work-related LBP	**Total sample**
Minimum age	**21**	22	**21**
Maximum age	**58**	64	**64**
Mean age	**36.1**	35.4	**35.8**
Standard deviation	**9.3**	9.0	**9.1**

An age group profile of the two subgroups is presented in Table 3. The biggest age group (21.9%) varied from 31 to 35 years, the smallest consisted of therapists over 56 years (3.3%).

Most physical therapists in the subgroup with work-related low back pain ranged from 26 to 30 years (9.3%), whereas the majority of therapists in the subgroup without work-related low back pain ranged from 31 to 35 years (13.2%).

Table 3. Age group profile of respondents

Age Group (yr)	Group with work-related LBP				Group without work-related LBP				Total sample			
	Male (#)	Female (#)	Total (#)	Percent of total	Male (#)	Female (#)	Total (#)	Percent of total	Male (#)	Female (#)	Total (#)	Percent of total
21-25	4	17	21	6.7	5	18	23	7.4	9	35	44	14.1
26-30	5	24	29	9.3	6	17	23	7.4	11	41	52	16.7
31-35	4	23	27	8.7	7	34	41	13.2	11	57	68	21.9
36-40	4	21	26	8.4	8	18	26	8.4	13	39	52	16.7
41-45	3	16	19	6.1	4	19	23	7.4	7	35	42	13.5
46-50	1	9	10	3.2	0	6	6	1.9	1	15	16	5.1
51-55	2	8	10	3.2	0	6	6	1.9	2	14	16	5.1
≥56	0	5	5	1.6	0	5	5	1.6	0	10	10	3.2
			6	1.9 Missing			5	1.6 Missing			11	3.5 Missing
Total	24	123	153	49.2	30	123	158	50.8	54	246	311	100.0

Academic training

Physical therapists held a variety of diplomas and degrees. The majority of them possessed Bachelor's degrees (75.9%), followed by diplomas in physical therapy (18.3%), and Master's degrees (5.5%). One female (0.3%) had a Doctorate degree.

Subgroups with and without work-related low back pain showed similar distribution of highest degree obtained. Once again majority held Bachelor's degrees (35.1%/37.0%), followed by diplomas in physical therapy (9.3%/9.0%), and Master's degrees (2.9%/2.6%). Details of academic training are given in Table 4.

Work settings

The biggest employers were hospitals (35.0%), private practices (32.5%), and rehabilitation centres (13.5%). Together 81% of respondents were employed in these settings. These three work settings were reported at the same order regardless of subgroups (Table 5).

Time held current employment

Sixty one point four percent of the therapists had held their current position for less than 5 years. In the subgroup with work-related low back pain 31.8% of therapists worked less than five years, 8.0% worked between six to ten years, 2.9% worked 16 to 20 years, 1.3% worked 11 to 15 years, and 1.3% worked 20 years and over at the same setting. In the subgroup with no LBP the percentage distribution of current job duration was as follows: 29.6% less than five years; 11.6%, six to ten years; 4.5%, 11-15 years; 0.6%, 16-20 years; and 0.6%, 20 years and over. Details of time held current position are given in Table 6.

Table 4. Academic training of physical therapists

Highest degree obtained	Group with work-related LBP				Group without work-related LBP				Total sample			
	Male (#)	Female (#)	Total (#)	Total Percent	Male (#)	Female (#)	Total (#)	Total Percent	Male (#)	Female (#)	Total (#)	Total Percent
Diploma in PT	5	24	29	9.3	4	24	28	9.0	9	48	57	18.3
B.PT	0	6	6	1.9	1	5	6	1.9	1	11	12	3.9
B.Sc.PT	19	90	109	35.1	24	91	115	37.0	43	181	224	72.0
M.Sc.	1	8	9	2.9	1	7	8	2.6	2	15	17	5.5
Ph.D.	0	0	0	0.0	0	1	1	.3	0	1	1	.3
Total	25	128	153	49.2	30	128	158	50.8	55	256	311	100.0

Table 5. Present work setting of respondents by subgroups

Work setting	Group with work-related LBP				Group without work-related LBP				Total sample			
	Male (#)	Female (#)	Total (#)	Total Percent	Male (#)	Female (#)	Total (#)	Total Percent	Male (#)	Female (#)	Total (#)	Total Percent
Hospital	5	50	55	17.7	7	47	54	17.4	12	97	109	35.0
Rehabilitation centre	1	18	19	6.1	1	22	23	7.4	2	40	42	13.5
University	1	2	3	1.0	2	3	5	1.6	3	5	8	2.6
Community care	0	4	4	1.3	0	5	5	1.6	0	9	9	2.9
Private practice	18	32	50	16.1	17	34	51	16.4	35	66	101	32.5
Long term care	0	12	12	3.9	0	9	9	2.9	0	21	21	6.8
Not working as a physical therapist	0	10	10	3.2	3	8	11	3.5	3	18	21	6.8
Total	25	128	153	49.2	30	128	158	50.8	55	156	311	100.0

Table 6. Current job duration by subgroups

Years	Group with work-related LBP				Group without work-related LBP				Total sample			
	Male (#)	Female (#)	Total (#)	Total Percent	Male (#)	Female (#)	Total (#)	Total Percent	Male (#)	Female (#)	Total (#)	Total Percent
≤ 5 yrs	16	83	99	31.8	17	75	92	29.6	33	158	191	61.4
6-10 yrs	5	20	25	8.0	4	32	36	11.6	9	52	61	19.6
11-15 yrs	1	3	4	1.3	5	9	14	4.5	6	12	18	5.8
16-20 yrs	3	6	9	2.9	0	2	2	.6	3	8	11	3.5
≤20 yrs	0	4	4	1.3	0	2	2	.6	0	6	6	1.9
Missing	—	—	12	3.8	—	—	12	3.8	—	—	24	7.7
Total	25	116	153	49.2	26	120	158	50.8	51	236	311	100.0

Job title

Characteristics of employment are summarized in the next six tables. In the subgroup of physical therapists with work-related low back pain, 41.7% of them were classified as staff therapists; 5.6% as educators, students, researchers, or administrators; and 2.9% as supervisors or clinical coordinators. The second subgroup without work-related low back pain was characterised as follows: 43.4% staff therapists; 4.0% supervisors or clinical coordinators; 3.3% educators, students, researchers, or administrators (Table 7).

Years of experience

Analysis of years of experience as a physical therapist disclosed that 27.7% of respondents had worked less than four years, 19.3% had worked five to nine years, 19.6% had worked 10 to 19 years, 11.9% had worked 15 to 19 years, and 21.5% had worked 20 years and over. See Table 8, for specific description of years of experience by subgroups.

Full versus part time employment

Most of these therapists were working full time (66.9%). Part time workers constituted 24.4% of total population. The remaining 8.7% were composed of missing data. The distribution of data with regards to subgroups with / without work-related low back pain was quite similar: full time workers 35.7% with LBP / 31.2% without LBP, part time workers 9.6% with LBP / 14.8% without LBP. Details of full versus part time employment are given in Table 9.

Table 7. Job title of respondents by subgroup

Job title	Group with work-related LBP				Group without work-related LBP				Total sample			
	Male (#)	Female (#)	Total (#)	Total Percent	Male (#)	Female (#)	Total (#)	Total Percent	Male (#)	Female (#)	Total (#)	Total Percent
Staff therapists	23	103	126	41.7	25	106	131	43.4	48	209	257	85.1
Supervisors or clinical coordinators	0	6	6	2.0	3	9	12	4.0	3	15	18	6.0
Educators, students, researchers, administrators	2	15	17	5.6	2	8	10	3.3	4	23	27	8.9
Total	25	124	149	49.3	30	123	153	50.7	55	247	302	100.0

Table 8. Years of experience as a physical therapist by subgroups

Years of experience	Group with work-related LBP				Group without work-related LBP				Total sample			
	Male (#)	Female (#)	Total (#)	Total Percent	Male (#)	Female (#)	Total (#)	Total Percent	Male (#)	Female (#)	Total (#)	Total Percent
0 - 4	10	32	42	13.5	12	32	44	14.2	22	64	86	27.7
5 - 9	6	27	33	10.6	5	22	27	8.7	11	49	60	19.3
10 - 14	5	22	27	8.7	7	27	34	10.9	12	49	61	19.6
15 - 19	2	14	16	5.1	3	18	21	6.8	5	31	37	11.9
20 and over	2	33	35	11.3	3	29	32	10.2	5	62	67	21.5
Total	25	128	153	49.2	30	128	158	50.8	55	256	311	100.0

Table 9. Full versus part time employment by subgroups

Employed	Group with work-related LBP				Group without work-related LBP				Total sample			
	Male (#)	Female (#)	Total (#)	Total Percent	Male (#)	Female (#)	Total (#)	Total Percent	Male (#)	Female (#)	Total (#)	Total Percent
full time	25	86	111	35.7	26	71	97	31.2	51	157	208	66.9
part time	0	30	30	9.6	1	45	46	14.8	1	75	76	24.4
missing	0	12	12	3.9	3	12	15	4.8	3	24	27	8.7
Total	25	128	153	49.2	30	128	158	50.8	55	256	311	100.0

Hours of direct patient contact per week

The majority of physical therapists (57.2%) were engaged in more than 25 hours of direct patient contact per week. The subgroup with work-related low back pain presented as follows: 30.2% of respondents had 25 hours or more of direct patient contact per week, 6.8% - 20 to 24 hours, 2.9% - 15 to 19 hours, 1.0% - 10 to 14 hours, 1.9% - five to nine hours, and 2.6% - four or less hours. Physical therapists without work-related low back pain reported subsequent numbers of hours of direct patient contact per week: 27.0% - 25 or more, 5.1% - 20 to 24, 4.5% - 15 to 19, 3.8% - 10 to 14, 2.6% - five to nine hours, and 3.5% - four or less. See Table 10.

Second position held

A review of data from valid questionnaires revealed that 15.4% of subjects held a second job at the time of completing survey. The remaining 84.6% did not work in a secondary setting. This percentage by subgroups with / without work-related low back pain is described as follows: those who held second employment 5.8% with LBP / 9.6% without LBP; and those who did not hold second employment 43.4% with LBP / 41.2% without LBP. For a more detailed description see Table 11.

Area of speciality

The most common area of speciality (Table 12) was orthopaedics (50.2%) overall, and for subgroups with LBP (24.1%) and without work-related LBP (26.1%). In the subgroup with work-related LBP, geriatrics (5.2%) was placed second, followed by neurology (4.8%), general practice (3.5%), cardiology (3.2%), pediatrics (2.3%), burns/plastics (1.3%), and home care/TENS program (0.6%). Physical therapists without work related LBP reported specialities as follows: neurology (5.5%), geriatrics (5.1%), general practice (4.2%), cardiology (2.9%), pediatrics (2.9%), and home care/TENS program (0.3%).

Table 10. Hours of direct patient contact per week

Hours	Group with work-related LBP				Group without work-related LBP				Total sample			
	Male (#)	Female (#)	Total (#)	Total Percent	Male (#)	Female (#)	Total (#)	Total Percent	Male (#)	Female (#)	Total (#)	Total Percent
≤ 4	1	7	8	2.6	1	10	11	3.5	2	17	19	6.1
5- 9	1	5	6	1.9	0	8	8	2.6	1	13	14	4.5
10-14	0	3	3	1.0	0	12	12	3.8	0	15	15	4.8
15-19	0	9	9	2.9	0	14	14	4.5	0	23	23	7.4
20-24	1	20	21	6.8	2	14	16	5.1	3	34	37	11.9
≤25	22	72	94	30.2	24	60	84	27.0	46	132	178	57.2
Missing	—	—	12	3.8	—	—	13	4.2	—	—	25	8.0
Total	25	116	153	49.2	27	118	158	50.8	52	234	311	100.0

Table 11. Secondary position held by subgroups

Variable	Group with work-related LBP				Group without work-related LBP				Total sample			
	Male (#)	Female (#)	Total (#)	Total Percent	Male (#)	Female (#)	Total (#)	Total Percent	Male (#)	Female (#)	Total (#)	Total Percent
Yes	2	16	18	5.8	5	25	30	9.6	7	41	48	15.4
No	23	112	135	43.4	26	102	128	41.2	49	214	263	84.6
Total	25	128	153	49.2	31	127	158	50.8	56	255	311	100.0

Table 12. Current area of specialty by subgroups

Area of specialty	Group with work-related LBP				Group without work-related LBP				Total sample			
	Male (#)	Female (#)	Total (#)	Total Percent	Male (#)	Female (#)	Total (#)	Total Percent	Male (#)	Female (#)	Total (#)	Total Percent
Neurology	0	15	15	4.8	1	16	17	5.5	1	31	32	10.3
Orthopaedics	20	55	75	24.1	21	60	81	26.0	41	115	156	50.2
Cardiology	1	9	10	3.2	3	6	9	2.9	4	15	19	6.1
Geriatrics	1	15	16	5.2	1	15	16	5.1	2	30	32	10.3
Burns/plastics	0	4	4	1.3	0	0	0	0.0	0	4	4	1.3
Pediatrics	0	7	7	2.3	0	9	9	2.9	0	16	16	5.1
General practice	3	8	11	3.5	2	11	13	4.2	5	19	24	7.7
Home care/TENS program	0	2	2	.6	0	1	1	.3	0	3	3	1.0
Missing	0	13	13	4.2	2	10	12	3.9	2	23	25	8.0
Total	25	128	153	49.2	30	128	158	50.8	55	256	311	100.0

Low back pain before becoming a physical therapist

The results of the survey also provided description of low back pain before entering the profession. All together 31.5% of subjects experienced at least one episode of low back pain before becoming a physical therapist. Three point two percent of them reported multiple episodes of LBP, and 1.9% experienced chronic LBP. Low back pain before becoming a physical therapist was reported by nineteen percent of respondents in the subgroup with following development of work-related LBP, and 12.5% of therapists in the subgroup without following development of work-related LBP (Table 13).

Setting in which low back injury occurred

The most common settings in which injury occurred were recreation (43.5%), work (19.6%), and sport (13.0%). The distribution of settings in which injury occurred by subgroups with and without following development of LBP is shown in Table 14.

Table 13. Number of episodes of LBP before working as a physical therapist

Number of episodes	Group with following development of work-related LBP				Group without following development of work-related LBP				Total sample			
	Male (#)	Female (#)	Total (#)	Total Percent	Male (#)	Female (#)	Total (#)	Total Percent	Male (#)	Female (#)	Total (#)	Total Percent
0	8	86	94	30.2	17	102	119	38.3	25	188	213	68.5
1	5	19	24	7.7	4	19	23	7.4	9	38	47	15.1
2	3	9	12	3.9	4	3	7	2.3	7	12	19	6.1
3	3	3	6	1.9	3	0	3	1.0	6	3	9	2.9
4	0	0	0	0.0	1	1	2	.6	1	1	2	.6
5	0	2	2	.6	0	1	1	.3	0	3	3	1.0
6	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
7	1	0	1	.3	0	0	0	0.0	1	0	1	.3
8	0	1	1	.3	0	0	0	0.0	0	1	1	.3
9	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Multiple	5	3	8	2.7	1	1	2	.6	6	4	10	3.2
Chronic	0	5	5	1.6	0	1	1	.3	0	6	6	1.9
Total	25	128	153	49.2	30	128	158	50.8	55	256	311	100.0

Table 14. Setting in which low back injury occurred before becoming a physical therapist

Setting in which injury occurred	Group with following development of work-related LBP		Group without following development of work-related LBP		Total sample	
	Number	Percent of total	Number	Percent of total	Number	Percent of total
Recreation	43	46.7	17	37.0	60	43.5
Sport	7	7.6	11	23.9	18	13.0
Home	6	6.5	1	2.2	7	5.1
Work	19	20.7	8	17.4	27	19.6
School	9	9.8	2	4.3	11	8.0
Other	8	8.7	7	15.2	15	10.8
Total	92	100.0	46	100.0	138	100.0

Activities being done during injury

Twenty five point four percent of responses indicated no specific activities led to injury, or that subjects could not remember any specific activities leading to injury. This percentage varied between subgroups. Of the group who developed LBP, 19.6% stated that no specific activities accounted for injury, 18.5% attributed injury to lifting and pulling/pushing, 16.3% to jumping, running, walking, 10.9% to sitting, 7.6% to bending, stooping, twisting, 7.6% to falling, slipping, 5.4% to skiing, skating, 3.3% to stretching, rolling, and 1.1% to standing.

Of the subgroup without following development of work-related LBP, 37.0% stated that no specific activities accounted for injury, 26.1% attributed injury to lifting and pulling/pushing, 21.7% to skiing, skating, 8.7% to stretching, rolling, 4.3% to jumping, running, walking (Table 15).

Limitations due to LBP before becoming a physical therapist

Forty percent of responses indicated that low back pain was a reason of decreasing non-work activities. Another common limitation (35.7%) described by respondents was a decrease in non-work activities together with a decrease in work activities. Twenty percent of responses described no limitations due to LBP. For more detailed characteristics of limitations due to LBP by subgroups refer to Table 16.

Table 15. Activities during injury of low back before becoming a physical therapist

Activities during injury	Group with following development of work-related LBP		Group without following development of work-related LBP		Total sample	
	Number	Percent of total	Number	Percent of total	Number	Percent of total
Lifting, pulling/pushing	17	18.5	12	26.1	29	21.0
Bending, stooping, twisting	7	7.6	0	0.0	7	5.1
Jumping, running, walking	15	16.3	2	4.3	17	12.3
Sitting	10	10.9	0	0.0	10	7.2
Standing	1	1.1	0	0.0	1	.7
Skiing, skating	5	5.4	10	21.7	15	10.9
Falling, slipping	7	7.6	0	0.0	7	5.1
Stretching, rolling	3	3.3	4	8.7	7	5.1
Other	9	9.8	1	2.2	10	7.2
No specific activities	18	19.6	17	37.0	35	25.4
Total	92	100.0	46	100.0	138	100.0

Table 16. Limitations due to low back pain before becoming a physical therapist

Limitations due to low back pain	Group with following development of work-related LBP		Group without following development of work-related LBP		Total sample	
	Number	Percent of total	Number	Percent of total	Number	Percent of total
Decreased non-work activities	36	38.3	20	43.5	56	40.0
Decreased work activities	4	4.3	2	4.3	6	4.3
Decreased non-work together with work activities	34	36.2	16	34.8	50	35.7
No limitations	20	21.3	8	17.4	28	20.0
Total	94	100.0	46	100.0	140	100.0

THE OCCURRENCE RATE OF WORK-RELATED LBP

Twenty-five males (45.5%) and 128 females (50.0%) reported work-related LBP. Overall, 153 subjects (49.2%) from the total analyzed population of 311 respondents indicated development of work-related LBP at some point in their lives.

Fifty-four (35.3%) physical therapists described at least one episode of work-related low back pain. Ninety-nine (64.7%) respondents experienced more than one episode of work-related LBP. For detailed description refer to Table 17.

Table 17. Number of work-related low back pain episodes

Number of episodes	Male Number	Female Number	Total Number	Total Percent
1	10	44	54	35.3
2	4	33	37	24.2
3	4	19	23	15.0
4	3	2	5	3.3
5	0	3	3	2.0
6	1	1	2	1.3
7	0	1	1	.7
8	0	1	1	.7
9	0	2	2	1.3
Multiple	2	13	15	9.8
Chronic	1	9	10	6.5
Total	25	128	153	100.0

AGE AND PROFESSIONAL EXPERIENCE AT THE TIME OF LOW BACK INJURY

The majority of physical therapists (35.3%) injured themselves between the ages of 20 and 25 years. It should be pointed out here that 60.1% of respondents experienced work-related LBP before the age of 30 years. Table 18 contains a summary of age at the time of initial onset of work-related LBP.

Table 18. Age at the time of initial onset of work-related low back pain

Age group	**Number of males**	Number of females	**Total Number**	Total percent
20-25	**8**	46	**54**	35.3
26-30	**7**	31	**38**	24.8
31-35	**2**	15	**17**	11.1
36-40	**1**	8	**9**	6.9
41-45	**0**	6	**6**	3.9
46-50	**1**	2	**3**	2.0
51 and over	**0**	3	**3**	2.0
Missing	—	—	**23**	15.0
Total	**19**	111	**153**	100.0

Fifty-five percent of physical therapists reported development of initial work-related LBP within five years after graduation. The following table (Table 19) shows information regarding time from graduation to the initial

onset of work-related low back pain.

Table 19. Time from graduation to initial onset of work-related LBP.

Number of Years from graduation	Male Number	Female Number	Total Number	Total Percent
0- 5	15	69	84	55.0
6-10	2	8	10	6.5
11-15	0	17	17	11.1
16-20	1	8	9	5.9
21-25	0	4	4	2.6
≥26	0	4	4	2.6
Missing	—	—	25	16.3
Total	18	110	153	100.0

WORK SETTING IN WHICH INJURY OCCURRED

The following table (Table 20) contains an outline of work settings in which injury occurred in relation to nine described episodes of low back pain.

Table 20. Work setting in which work-related injury occurred

Work setting	Episode of low back pain									Male (#)	Female (#)	Total (#)	Total Percent
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th				
Community care	2	2	3	2	1	0	0	0	0	0	10	10	3.3
Hospital	83	36	12	5	5	3	2	2	2	17	133	150	49.5
Long term care	12	11	6	0	1	1	0	0	0	2	29	31	10.2
Private practice	26	18	14	8	1	0	0	0	0	21	46	67	22.1
Rehabilitation centre	14	9	4	0	0	0	1	1	0	1	28	29	9.6
University	2	0	0	0	0	0	0	0	0	0	2	2	.7
Other	5	3	2	1	1	1	1	0	0	0	14	14	4.6
Total	**144**	79	**41**	16	**9**	5	**4**	3	**2**	41	**262**	303	**100.0**

ACTIVITIES DURING WORK-RELATED LOW BACK INJURY

The information gathered from nine described work-related LBP episodes were summarized and multiple response frequencies were used to describe activities being done during injury, and limitations due to work-related LBP.

The biggest group of therapists (31.2%) reported patient handling as a major group of activities being done during work-related low back pain injury. For more information refer to Table 21.

LIMITATIONS DUE TO WORK-RELATED LOW BACK INJURY

The most frequently (36.2%) described limitation due to work-related injury was decreased non-work activities, followed by restricted duties at regular job. The severity of back discomfort had been sufficient to require 13.7% of the therapists to stop their work. As a result of low back pain 2.4% of the subjects changed work setting. Nineteen point nine percent of the respondents indicated no limitations due to low back pain. Table 22 presents gathered data.

Table 21. Activities during work-related low back injury

Category	Number	Total Percent
Bending, bending and twisting, stooping	**91**	22.5
Lifting, lifting and twisting, carrying, pulling/pushing	**91**	22.5
Patient handling	**126**	31.2
Patient falling	**18**	4.5
Prolonged sitting	**28**	6.9
Prolonged standing	**15**	3.7
Other	**35**	8.7
Total responses	**404**	100.0

Table 22. Limitations due to work-related low back pain

Category	Number	Total Percent
Sick leave	**43**	10.3
Compensation	**14**	3.4
Decreased non-work activities	**151**	36.2
Decreased number of working hours	**27**	6.5
Restricted duties at regular job	**88**	21.1
Change of work setting	**10**	2.4
No limitations	**83**	19.9
Other	**1**	.2
Total responses	**417**	100.0

CURRENT LOW BACK PAIN AND RESULTING DISABILITIES

Scores of the Disability Index Questionnaire, used to assess level of disability among physical therapists with current work-related LBP, were as follows: minimum reported value was 0 (14.3%), maximum 10 (1.8%). The average disability level was 3 (12.5%), and most frequent reported value 1 (23.2%). See Table 23.

Table 23. Disability Index Questionnaire

Number of ticked values	**Male Number**	Percent of males	**Female Number**	Percent of females	**Total Number**	Total Percent
0	**2**	3.6	**6**	10.7	**8**	14.3
1	**3**	5.4	**10**	17.9	**13**	23.2
2	**1**	1.8	**9**	16.1	**10**	17.9
3	**1**	1.8	**6**	10.7	**7**	12.5
4	**1**	1.8	**3**	5.4	**4**	7.1
5	**1**	1.8	**2**	3.6	**3**	5.4
6	**0**	0.0	**2**	3.6	**2**	3.6
7	**0**	0.0	**3**	5.4	**3**	5.4
8	**0**	0.0	**5**	8.9	**5**	8.9
10	**0**	0.0	**1**	1.8	**1**	1.8
Total	**9**	16.1	**47**	83.9	**56**	100.0

Each respondent with work-related LBP was asked questions regarding current low back pain. Fifty-six subjects (36.6%) out of 153 physical therapists with work-related low back pain reported having back pain at the time of completing the questionnaire. Ninety-seven (63.4%) physical therapists in this group did not have low back pain at that time. Despite LBP, 54 (35.3%) of therapists continued to work with current pain, two (1.3%) were off work due to low back pain (Table 24).

Table 24. Work with current pain

Category	**Male** (#)	Percent of males	**Female** (#)	Percent of females	**Total** (#)	Total Percent
Working with LBP	**9**	5.9	**45**	29.4	**54**	35.3
Off work due to LBP	**0**	0.0	**2**	1.3	**2**	1.3
No pain at present	**16**	10.5	**81**	52.9	**97**	63.4
Total	**25**	16.4	**128**	83.6	**153**	100.0

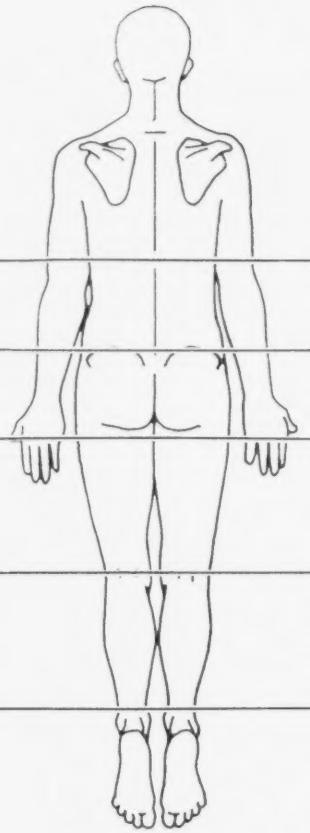
Fifty-six physical therapists with present low back pain described current pain intensity using the pain rating scale. The following are the results (Table 25).

Table 25. Current pain intensity

Category	**Male** (#)	Percent of males	**Female** (#)	Percent of females	**Total** (#)	Total Percent
Very bad pain	**0**	0.0	**1**	1.8	**1**	1.8
Quite bad pain	**0**	0.0	**1**	1.8	**1**	1.8
Moderate pain	**2**	3.6	**21**	37.5	**23**	41.1
Little pain	**7**	12.5	**24**	42.9	**31**	55.4
Total	**9**	16.1	**47**	83.9	**56**	100.0

Allocation of work-related low back pain is presented in Figure 1. The most frequently reported location of pain was the area of the low back and buttocks (50.0%), followed by the low back (25.0%), and the back pain radiating to the thigh (16.1%), the shank (5.4%), and the foot (3.6%).

Figure 1. Location of current low back pain



	Male	Percent	Female	Percent	Total Count	Total Percent
Low back	4	7.1	10	17.9	14	25.0
Low back & buttocks	2	3.6	26	46.4	28	50.0
Thigh	2	3.6	7	12.5	9	16.1
Shank	1	1.8	2	3.6	3	5.4
Foot	0	0.0	2	3.6	2	3.6

CHI-SQUARE ANALYSIS COMPARING PHYSICAL THERAPISTS WITH WORK-RELATED LBP WITH THOSE WHO HAD NOT EXPERIENCED WORK-RELATED LOW BACK PAIN

Nineteen personal and professional characteristics were used to compare physical therapists who had experienced work-related low back pain with those who had not experienced work-related low back pain. In order to compensate for multiple testing, a Bonferroni correction was applied. The Bonferroni method was used to reduce the experimentwise error rate to an acceptable level of 0.05. This correction produced an individual or per comparison error rate of 0.05/19=0.003. The type I error rate for the 19 statistical tests has been, therefore, corrected to the 0.05 level.

No significant difference between the two groups was observed (Table 26) at the <0.003 level. However the groups differed on two factors at the <0.01 level, physical disability and the time held current employment.

Table 26. Chi-square analysis of physical therapists with work-related LBP versus therapists without work-related LBP.

Category	Chi-square	Df	Significance
Sex	.37426	1	.54069
Age	5.92889	7	.54808
Year graduated	6.75280	8	.56352
Academic training	1.15699	4	.88513
Medically diagnosed conditions before developing LBP	5.30855	4	.25708
Physical disability	6.22206	1	.01262
Diagnosis of physical disability	14.15676	9	.11686
Current job title	4.90332	3	.17902
Last job title	1.69198	3	.63872
Current specialty	5.11934	8	.74475
Last specialty	5.04795	6	.53768
Years of experience	2.17997	4	.70270
Primary work setting	1.40731	6	.96541
Primary position held	19.84527	16	.22727
Time held current employment	12.83371	4	.01212
Full vs. part time employment	4.56486	2	.10204
Hours of patient contact	8.42953	5	.13410
Secondary position held	8.98662	6	.17433
LBP before working as a PT	15.79504	9	.07129

CHAPTER V

DISCUSSION AND CONCLUSIONS

It is apparent that LBP is a common disorder, affecting a large number of physical therapists. The physical therapy population is at great risk for developing LBP, and the number of back injuries is high. It was expected that this study would document the extent of low back pain as a public health problem among physical therapists, which was achieved. It was researcher's opinion that the group of physical therapists with work-related low back pain would differ from those individuals who did not experience work-related low back pain. In fact, no significant differences between those two groups were found.

STUDY GROUP DESCRIPTION

Three hundred thirty seven (72.9%) out of 462 physical therapists from Edmonton returned a questionnaire. The most serious drawback of any mail questionnaire is possible lack of response. Responses to mail questionnaires are generally poor. Returns of less than 40 to 50 percent are common. Higher percentage are rare. As a result of low returns valid generalization cannot be made[46]. In this study, every possible attempt was made (inclusion of a self addressed stamped envelope in the questionnaire package, a follow-up letter) to

facilitate the return rate. These efforts and interest in back pain amongst physical therapists probably contributed to the high response rate. The representativeness of the sample was not a concern in this study, since 311 out of 462 (finite population of physical therapists living in Edmonton) subjects returned the questionnaire. Furthermore, an effort was made to compare finite population of therapists in Edmonton with the sample based on gender. The whole group (18.4% males, 81.6% females) was considered to be similar to the analyzed sample (17.7% males, 82.3% females) in terms of sex distribution.

Although, no significance differences between those with and those without work-related LBP were seen, p values of 0.1 were found regarding physical disability and time held current employment. There could be several possible explanations for that. First, some disabilities may create factors predisposing an individual to back injury. Second, the physical therapists with disabilities may be less independent during manual lifting activities performed commonly in health care settings. Therefore, lack of help from other staff may result in low back injury. A third explanation relates to time held current employment. The physical therapists with work-related low back pain tend to change the work settings more frequently than those without back pain. Perhaps, the injured therapists can not continue to work at present settings because of pain, or persist to seek for a job which does not impose stress on the lumbar spine.

THE OCCURRENCE RATE OF WORK-RELATED LOW BACK PAIN

The occurrence rates of work-related low back pain, reported in the literature, vary considerably among authors. Several studies have identified no sex difference in relation to its occurrence[10,11,66,68]. Hence, the no sex difference, noted for low back injury in this study, is not surprising.

Overall, 49.2% of physical therapists reported work-related low back pain in this study. This figure can be compared to that reported among nurses (52.0%) by Harber et al[38], but is higher than those reported by Stubbs et al[91] (43.1%), and Cust et al[26] (19.9%).

The higher occurrence of work-related LBP among physical therapists than among nurses may be explained by the fact that the physical therapy profession is a more stressful occupation in terms of presence of occupational factors associated with LBP. Patient handling activities are quite common in both professions, but it is the researcher's opinion that physical therapists perform these activities for a longer period of time during each working day, increasing the risk of incurring work-related LBP.

A lifetime LBP prevalence of 57% among physical therapists was showed by Scholey and Hair[85]. Non work-related low back pain was not a subject and was not included in this study. Hence, the relationship between work-related LBP and back pain precipitated outside of work was not investigated.

Therefore, the cited above value cannot be compared to current investigation. Molumphy et al.[68] documented that 29.0% of physical therapists reported work-related LBP. An additional 23% had experienced LBP that was not work-related, therefore, 52% of the physical therapists had suffered from LBP. This study was conducted in the United States, and was based on a randomly selected sample. There could be three possible explanations of the inconsistency in presented rates of work-related LBP between physical therapists in California and Edmonton. First, the difference may have resulted from the five-year time limit imposed by Molumphy's study. Second, the working patterns between California and Edmonton may differ enough to introduce the discrepancy and consequently result in dissimilar occurrence rates of work-related LBP. Third, during random sample procedure, used by Molumphy et al.[68], some physical therapists with LBP could be missed. Further, the characteristics of individuals who took the time to respond to the questionnaires may be different from those who did not. This may have introduced some biases.

AGE AND PROFESSIONAL EXPERIENCE AT THE TIME OF INJURY

Demographic data, presented in the literature, indicated that health care employees injure their backs at an earlier age than other industrial workers[14,68]. Overall, 60.1% of physical therapists with work-related LBP described

development of initial work-related LBP before or at the age of 30 years. Fifty five point six percent of these episodes occurred within the first five years after graduation. This early onset is similar to that reported in other health care professions[26,28,68,91]. This highlights the problem for the relatively inexperienced physical therapy practitioner in a particularly stressful situation. New physical therapists are not experienced in proper lifting techniques, or cannot consistently apply the biomechanical principles of lifting recommended in the literature[52], or may feel uncomfortable requesting assistance with patient handling from other staff.

Molumphy et al.[68] reported a 63% recurrence rate of LBP episodes. Results of this study are fully comparable with those stated above. Ninety-nine subjects (64.7%) described at least one recurrence episode of work-related LBP. Within this group 15 (9.8%) physical therapists describe multiple episodes of work-related LBP and 10 (6.5%) respondents stated having chronic LBP. Possible differences between people reporting one and multiple episodes of low back pain can be as follows: some therapists might move out off a job after suffering back pain, some therapists can be more susceptible to injury than others, some therapists might have genetic predispositions to develop LBP, or the previous severe back injury might be triggered even by small factors.

Dehlin et al[28] reported a much higher recurrence rate (82.0%) among nursing aides. Academic training of physical

therapists, as well as the nature of work require involvement in back care education. Perhaps, appropriate knowledge and skills prevented recurrence of LBP episodes. This assumption requires further investigation and cannot be taken for granted.

WORK SETTINGS IN WHICH INJURY OCCURRED

The majority of physical therapists (49.5%) reported occurrence of low back pain while working in the hospital. Molumphy et al[68] described that 46.4% of individuals first experiencing low back pain worked in acute care facilities. The acute care facilities were included in hospital settings in current research. The results of both studies are quite similar. Molumphy et al[68] proposed the following explanation for this finding. Hospital and, therefore, acute care involves treating patients who are likely less independent than patients treated in ambulatory settings. In general, patients in acute care require intensive therapy and this may contribute to the possibility of error in therapist judgement of patient capabilities. The second reason is that newly graduated therapists often seek employment in this setting. This combination of inexperience and working in an environment with increased physical demands may increase the risk of incurring work-related LBP.

ACTIVITIES DURING WORK-RELATED LOW BACK INJURY

At the time of injury therapists were most commonly handling patients, bending, stooping, lifting, carrying, pushing or pulling. Associations of LBP with prolonged bending[52] and stooping[77] have been noted and cited as risk factors by a number of researchers[14,16,33,52,53]. Twisting and turning as investigated by Westrin (1970)[102], Buckle (1983)[16] and Frymoyer et al. (1980)[33] have also been correlated to increased risk of back pain. Magora (1972)[61] found that prolonged standing or sitting were related to a higher incidence of back pain. Chaffin (1974)[21] reported that those engaged in jobs where lifting demands exceeded strength capabilities showed a dramatic increase in job related LBP. Kumar (1989, 1990)[52,53] showed a strong correlation between cumulative load and low back pain. In addition, the relation between symptoms and physical work-load may be reinforced by the domestic work-load. The spinal-loading both at home and at work might reach a high level. This factor may increase the risk of low back injury. However, this aspect was not investigated. Nevertheless the physical therapy profession clearly has an abundance of risk factors associated with development of back pain.

LIMITATIONS DUE TO WORK-RELATED LOW BACK PAIN

Low back injuries and resultant limitations have been the subject of much study and even more debate and discussion. Impairments of back and spine are the most frequent cause of activity limitations in persons under age 45, the largest age group within the workforce[70]. In this study, work-related low back pain among physical therapists had several consequences. The most frequently reported limitations were decreased non-work activities (36.2%) and restricted duties at regular job (21.1%). Thirteen point seven percent of responses indicated that the physical therapists had used sick leave or worker's compensation benefits as a result of work-related low back pain. It is difficult to determine accurately the cost of absence from work, since many variables are involved. The cost of work-related LBP can be divided into direct and indirect costs[101]. Direct costs include payments for medical care and compensation for lost wages, and are usually covered by Workers' Compensation insurance. Indirect costs include the effects of low morale in settings experiencing high staff turnover, greater insurance premiums, property damage, lost wages, administrative and legal costs, and the cost of training a new employee to replace one who has been injured[90]. An important, but difficult to quantitate factor is psychological support provided to patients during treatments. Physical therapists with significant personal discomfort may

be impaired in that area, particularly if they feel that the job causes the pain. Thus, even back pain that does not lead to lost work time can have significant effects on patient care efficiency.

CURRENT LOW BACK PAIN AND RESULTING DISABILITY

Fifty-six physical therapists out of 153 individuals with work-related pain reported having low back pain at the time of completing the questionnaire. Despite low back pain 54 (35.3%) of them continued to work with current pain. Two (1.3%) were off work due to LBP. The majority (55.4%) of respondents with current LBP reported little pain, which is not surprising, because high pain intensity would prevent them from working.

The distribution of pain by site showed the following. The greatest percentage of physical therapists (50.0%) reported pain worst in the low back and buttocks. The second greatest percentage of respondents (20.0%) reported low back pain only. Twenty-five percent of subjects reported leg dominant pain in combination with LBP. This kind of pain usually involves the nerve root entrapment (sciatica) and accounts for about 10%[63] of all kinds of reported low back pain.

As for disability associated with current low back pain thirty-eight (55.4%) subjects out of fifty-six with current

LBP reported little or no disability (0-3 on the scale from 0 to 24). The maximum reported value of 10 was described by 1.8% of all respondents. Although, this factor was not investigated, the following explanation is proposed. Knowing the mechanisms of injury, possible disability or impairment, and working with highly disabled people may lead to the tendency of underestimation of the factors related to "own" low back pain.

CONCLUSION

This study provides data on the occurrence of work-related low back pain among physical therapists and describes the personal and professional characteristics of physical therapists who reported pain.

It is apparent that low back pain is a common disorder affecting a large number of physical therapists. The physical therapy profession is at great risk for developing LBP, has an abundance of factors associated with development of back pain, and the number of back injuries is high. Low back pain contributes to decreased productivity and adds significantly to the costs of health care.

Increasing recognition of this problem within the physical therapy profession and considerably more formal research into its epidemiology, etiology, and prevention is needed.

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APPENDIX A

THE LETTER OF PERMISSION

University of Alberta
Edmonton
Canada T6G 2G4

Department of Physical Therapy
Faculty of Rehabilitation Medicine
2-50 Corbett Hall Telephone (403) 492-5983
Fax (403) 492-1626

November 18, 1993

Ms. JoAnne Horne
College of Physical Therapists of Alberta
#302, 6020 - 104 Sreet, Edmonton, Alberta T6N 5S4

Re: CPTA Mailing labels

Dear Ms. Horne:

I am conducting a survey to investigate the occurrence of low back pain among physical therapists in Edmonton. The study will provide information about extent of low back pain problems among physical therapists.

Your College might benefit from the results of the study. Therfore, I would greatly appreciate if I could get your permission to obtain a set of CPTA mailing labels. They will be used when conducting the study for my Master's thesis.

IT IS UNDERSTOOD AND AGREED -

That the labels will not be reproduced or passed on to other users;

That labels will be kept confidential;

That labels will be used for the purpose stated in my request.

I would like to advise the College that Mr. Shrawan Kumar Ph. D. is my academic supervisor. He can be reached at 492-5983.

If you require more information please call me at 492-6002.

Thank you for considering my request.

Sincerely,

Mac Mierzejewski
Master's of Science Candidate,

APPENDIX B

THE INTRODUCTORY LETTER

University of Alberta
Edmonton
Canada T6G 2G4

Department of Physical Therapy
Faculty of Rehabilitation Medicine
2-50 Corbett Hall, Telephone: (403) 492-5983
Fax: (403) 492-1626

August 16, 1993

Dear Colleaque:

The Physical Therapy Department at the University of Alberta is conducting a study on the occurrence of low back pain among physical therapists in Edmonton, in hopes of gaining some information on the risk of low back pain among PT's. The attached questionnaire requests some demographic data, information on your professional background, current work setting details, and any experience of low back pain. It will take approximately 25 minutes of your time to complete.

By responding to the enclosed questionnaire you are giving consent to participate in the study, and permission for the results to be published without identifying you personally. All information provided will be kept confidential, with access limited to the investigator and his academic supervisor.

The questionnaire includes a code number so we can keep track of who has answered. Your participation in this project is voluntary and you may refuse to answer any particular questions. Should you not wish to participate, please return the questionnaire so that we will know that you are not interested.

If you do wish to participate, return the completed questionnaire by September 15, 1993, using the enclosed stamped, self-addressed envelope.

If you have any questions regarding this study, please contact me at 488-2596.
Thank you for considering my request.

Sincerely,

Mac Mierzejewski
Master's of Science Candidate,
University of Alberta

Academic Supervisor: Shrawan Kumar, Ph.D., Phone: 492-5983

APPENDIX C
THE QUESTIONNAIRE

Code# _____

OCCURRENCE OF LOW BACK PAIN (LBP)
AMONG PHYSICAL THERAPISTS

Each item in this questionnaire can be answered by words or checking the appropriate [ ]. **You can tick all boxes which apply.** LBP throughout the questionnaire refers to pain in the lumbo-sacral area.

SECTION 1

This section contains questions on demographic data and professional background.

1. **Gender:** [ ] Male [ ] Female

2. **Age:** _____

3. **Year graduated** (Diploma or Bachelor Degree): 19 _____

4. **Academic Training:**

   [ ] Diploma in PT [ ] Ph.D.
   [ ] B.Sc. (PT) [ ] Other (specify): _____
   [ ] M.Sc.

5. **Did you suffer from any of the following medically diagnosed and treated conditions before you developed LBP?**

   [ ] scoliosis [ ] leg length discrepancy [ ] No
   [ ] muscle diseases [ ] connective tissue diseases

6. **Do you presently have a physical disability or chronic medical condition?**

   [ ] Yes [ ] No

7. **If yes, please state current diagnosis** (e.g. rheumatoid arthritis):

   _____

8. **Employment**

   a. Current job title, if presently working:
   (please answer regardless of whether working as a PT or not)

   _____

   b. Last job title, if not presently working (whether as a PT or not):

   _____

9. **Current/last area of speciality working as a PT** (eg. orthopedics):

   _____

10. **Total number of years you have worked as a physical therapist:**

    [ ] ≤ 4 [ ] 5 - 9 [ ] 10 - 14 [ ] 15 - 19 [ ] 20 and over

11. Current work setting if working as a PT.
(if you hold more than two positions, please describe the two at which you spend most hours)

A. First position held:

-- HOSPITAL:
[ ] administration
[ ] inpatient
[ ] outpatient
[ ] other:_____

REHABILITATION CENTRE:
[ ] administration
[ ] inpatient
[ ] outpatient
[ ] other:_____

UNIVERSITY:
[ ] administration
[ ] academic/research
[ ] teaching
[ ] other:_____

COMMUNITY CARE:
[ ] administration
[ ] home visit
[ ] other:_____

PRIVATE PRACTICE:
[ ] administration
[ ] patient care
[ ] other:_____

LONG TERM CARE:
[ ] administration
[ ] patient care
[ ] other:_____

-- HOW LONG HAVE YOU HELD THIS POSITION?
[ ] ⩽ 5 yrs [ ] 6 - 10 yrs [ ] 11 - 15 yrs [ ] 16 - 20 yrs [ ] 20 yrs & over

-- EMPLOYED: [ ] full time [ ] part time

-- HOURS OF DIRECT PATIENT CONTACT PER WEEK:
[ ] ⩽ 4 [ ] 5 - 9 [ ] 10 - 14
[ ] 15 - 19 [ ] 20 - 24 [ ] 25 & over

B. Second position held (if applicable):

-- HOSPITAL:
[ ] administration
[ ] inpatient
[ ] outpatient
[ ] other:_____

REHABILITATION CENTRE:
[ ] administration
[ ] inpatient
[ ] outpatient
[ ] other:_____

UNIVERSITY:
[ ] administration
[ ] academic/research
[ ] teaching
[ ] other:_____

COMMUNITY CARE:
[ ] administration
[ ] home visit
[ ] other:_____

PRIVATE PRACTICE:
[ ] administration
[ ] patient care
[ ] other:_____

LONG TERM CARE:
[ ] administration
[ ] patient care
[ ] other:_____

-- HOW LONG HAVE YOU HELD THIS POSITION?
[ ] ⩽ 5 yrs [ ] 6 - 10 yrs [ ] 11 - 15 yrs [ ] 16 - 20 yrs [ ] 20 yrs & over

-- EMPLOYED: [ ] full time [ ] part time

-- HOURS OF DIRECT PATIENT CONTACT PER WEEK:
[ ] ⩽ 4 [ ] 5 - 9 [ ] 10 - 14
[ ] 15 - 19 [ ] 20 - 24 [ ] 25 & over

SECTION 2

This section contains questions related to low back pain (LBP) **before working as a physical therapist.**

How many episodes of LBP have you experienced before working as a PT ? _____

If more than five times please describe circumstances of the first five episodes:

Episodes of LBP	**1st**	**2nd**	**3rd**	**4th**	**5th**
Month and Year of onset of pain/injury (please approximate):					
Average pain intensity on a scale from 1 to 10 1 - no pain 10 - severe pain					
Duration of pain in days:					
Setting in which injury occurred (e.g. work, recreation, etc.):					
Activity(ies) being done during injury(eg. lifting):					
Limitations due to LBP (check more than one if applicable):					
a. decreased non-work activities	[ ] Yes	[ ] Yes	[ ] Yes	[ ] Yes	[ ] Yes
b. decreased work activities	[ ] Yes	[ ] Yes	[ ] Yes	[ ] Yes	[ ] Yes

SECTION 3

This section contains questions related to low back pain (LBP) **due to work as a physical therapist.**

How many episodes of LBP have you experienced while working as a physical therapist ? _____

If none , please omit the rest of this questionnaire; if some, please continue to answer this section.

Episodes of LBP	**1st**	**2nd**	**3rd**	**4th**	**5th**	**6th**	**7th**	**8th**	**9th**
Month and Year of onset of pain/injury (please approximate):									
Average pain intensity on a scale from 1 to 10 1 - no pain 10 - severe pain									
Duration of pain in days:									
Work setting in which injury occurred (check appropriate box):									
- community care	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
- hospital	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
- long term care	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
- private practice	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
- rehabilitation centre	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
- university	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
- other (specify):									

Episodes of LBP	**1st**	**2nd**	**3rd**	**4th**	**5th**	**6th**	**7th**	**8th**	**9th**
Activity during injury (check appropriate boxes)									
- bending	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
- bending and twisting	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
- carrying	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
- lifting	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
- lifting and twisting	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
- patient handling	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
- patient falling	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
- prolonged sitting	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
- prolonged standing	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
- pulling/pushing	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
- stooping	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
- other (specify):									
Limitations due to LBP (check appropriate boxes)									
- sick leave	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
- compensation	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
- decreased non-work activities	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
- decreased number of working hours	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
- restricted duties at regular job	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
- change of work setting	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
- other (specify):									

SECTION 4

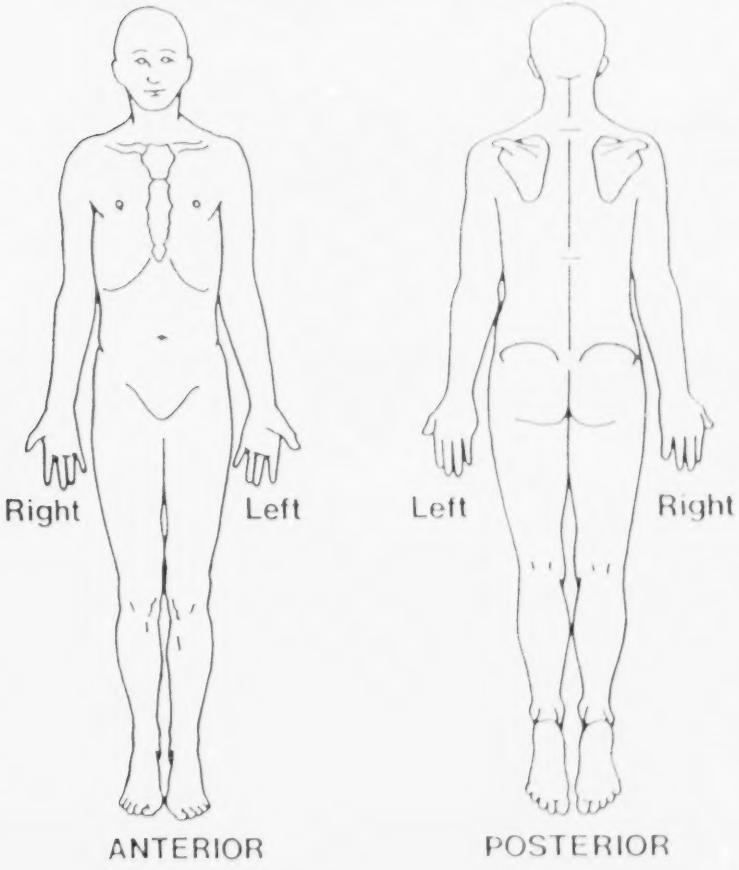
The following section includes questions about disability and pain **at the present moment.**

If you have low back pain at the present moment please answer the following questions.
If you do not have pain now, omit the rest of this questionnaire.

Are you [ ] working with current pain? [ ] off work due to pain?

LOCATION OF PAIN

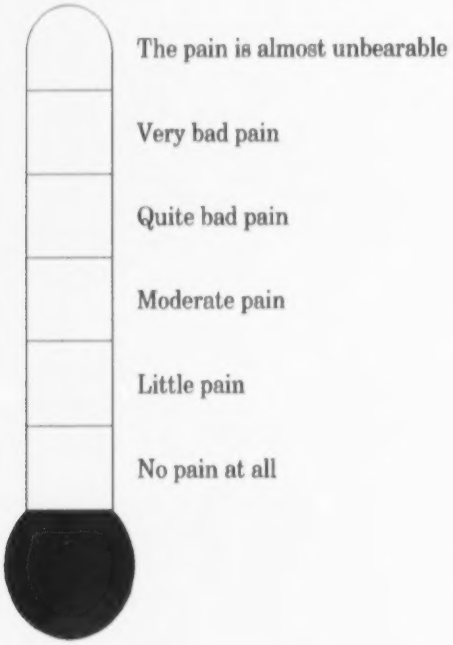
Mark areas on your body where you feel pain at the present moment. Include all affected areas.



PAIN RATING SCALE

Now we would like you to give us an idea of just how bad your pain is at the moment. Here is a thermometer with various grades of pain from "no pain at all" at the bottom to "the pain is almost unbearable" at the top. We want you to put a cross by the words that best describe your pain.

REMEMBER, we want to know how bad your pain is at the moment.



DISABILITY INDEX QUESTIONNAIRE
Royland and Morris

When your back hurts, you may find it difficult and painful to do some of the things you normally do.

The questionnaire on the following page contains some sentences that people have used to describe themselves when they have back pain. When you read them, you may find that some stand out because they describe you today. As you read the questionnaire, think of yourself. When you read a sentence that describes you accurately, put a tick mark next to it. If the sentence does not describe you today, then leave the space blank and go on to the next one.

REMEMBER, only tick the sentence if you are sure that it describes you accurately.

[ ] I stay at home most of the time because of my back.

[ ] I change position frequently to try and get my back comfortable.

[ ] I walk more slowly than usual because of my back.

[ ] Because of my back, I am not doing any of the jobs that I usually do around the house.

[ ] Because of my back, I use a handrail to climb up the stairs.

[ ] Because of my back, I lie down to rest more often.

[ ] Because of my back, I have to hold on to something to get out of an easy chair.

[ ] Because of my back, I try to get other people to do things for me.

[ ] I get dressed more slowly than usual because of my back.

[ ] I only stand up for short periods of time because of my back.

[ ] Because of back, I try not to bend or kneel down.

[ ] I find it difficult to get out of a chair because of my back pain.

[ ] My back is painful almost all the time.

[ ] I find it difficult to turn over in bed because of my back.

[ ] My appetite is not very good because of my back pain.

[ ] I have trouble putting on my socks (or stockings) because of my back.

[ ] I only walk short distances because of my back pain.

[ ] I sleep less well because of my back.

[ ] Because of my back pain, I get dressed with help from someone else.

[ ] I sit down for most of the day because of my back.

[ ] I avoid heavy jobs around the house because of my back.

[ ] Because of my back pain, I am more irritable and bad tempered with people than usual.

[ ] Because of my back, I climb up the stairs more slowly than usual.

[ ] I stay in bed most of the time because of my back.

Thank you for answering this questionnaire.

APPENDIX D

THE FOLLOW-UP LETTER

University of Alberta
Edmonton
Canada T6G 2G4

Department of Physical Therapy
Faculty of Rehabilitation Medicine
2-50 Corbett Hall, Telephone: (403) 492-5983
Fax: (403) 492-1626

15 September 1993

Dear Colleague:

The Physical Therapy Department at the University of Alberta sent you a questionnaire regarding low back pain among physical therapists.

I have not received your reply yet. If you have already sent it back to me, please disregard this letter. If not, please take time to fill it out as your input is of great significance for this research.

If you have any questions regarding this study, please contact me at 488-2596.

Sincerely,

Mac Mierzejewski
Master's of Science Candidate,
University of Alberta

Academic Supervisor: Shrawan Kumar Ph.D., Phone: 492-5983